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Surgical Treatment of Spasticity

IN RECENT YEARS new surgical techniques have been developed that are effective in alleviating spasticity in selected patients. A decade ago, selective dorsal rhizotomy was reported to be effective in alleviating spasticity in children with cerebral palsy; the procedure has since been modified. This neurosurgical operation reduces spasticity by cutting selected posterior nerve rootlets on the basis of intraoperative electrical stimulation and electromyographic recordings. In recent years, interest in this procedure has grown in the United States, and it is being done in several neurosurgical centers across the country. Objective documentation and quantification of the results of this operation as measured by electrophysiologic techniques, physical therapy assessments, and sophisticated gait laboratories are now available.

The procedure is clearly not a panacea for cerebral palsy. It does, however, decrease spasticity, which for some children is a source of major disability. For nonambulatory patients, the operation can increase range of motion; improve sitting, dressing, and positioning; and may lead to gains in functional mobility. For ambulatory patients, it can increase stride length and walking velocity; improve motion about the thighs, knees, and ankles; and ameliorate foot-floor contact. Patients need to be carefully selected with emphasis on ascertaining the clinical importance of obstructive spasticity. Most commonly, cerebral palsy has been the underlying condition, although occasionally patients with spasticity due to myelomeningocele, multiple sclerosis, or head or spinal cord trauma may also benefit.

When chronic pain and spasticity complicate the care of patients with stroke or spinal cord injury, microsurgical lesions at the dorsal root entry zone have been shown to be effective in reducing tone and in alleviating pain.

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Use of High-Dose Glucocorticoids in Acute Head and Spinal Cord Injuries

THE EFFICACY OF GLUCOCORTICOIDS in the treatment of acute head and spinal cord injuries has been uncertain. In both instances, experimental work has suggested that these drugs would have a beneficial effect. The results have been mixed, though, when the effect of these drugs has been studied clinically. In patients with acute head injuries, the glucocorticoids appear to reduce mortality but do not improve outcome and do not make the control of intracranial pressure easier. Similarly, with acute spinal cord injuries, no difference in outcome exists between patients treated with standard or those with high-dose methylprednisolone.

The reason that much of the data have been inconclusive has been related to deficiencies in the design of the studies in which the use of glucocorticoids was investigated. These shortcomings in clinical studies have included a reliance on retrospective studies, inadequate controls, unsatisfactory randomization, a failure to blind aspects of studies, a lack of objective evaluation, an insufficient number of patients, and the inclusion of unqualified patients.

Many of these problems in experimental design would seem to have been overcome in the recently completed second National Acute Spinal Cord Injury Study. In this multicenter, randomized, double-blind, and controlled study of 487 patients with acute spinal cord injuries, patients received either methylprednisolone sodium succinate, naloxone hydrochloride, or placebo. Methylprednisolone was administered in the form of a bolus dose of 30 mg per kg given over 15 minutes, followed in 45 minutes by an infusion of 5.4 mg per kg hourly for 23 hours. At six months' follow-up, those patients who had been administered methylprednisolone within eight hours of their injury had a substantial improvement in their neurologic status—motor, superficial pain, and touch sensation—compared with those who had received a placebo. This improvement occurred whether or not patients initially were judged to have either a complete or incomplete spinal cord lesion. The outcome in those patients given naloxone or methylprednisolone more than eight hours after their injury did not differ from that of those who had received a placebo. Major morbidity and mortality were similar in all groups of patients.

The obvious question in light of the demonstrated efficacy of using glucocorticoids in patients with acute spinal cord injuries is whether or not a similar well-designed study is now justified in patients with acute head injuries.

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Warning Leaks and Subarachnoid Hemorrhage

RECENT IMPROVEMENTS IN OUTCOME after a subarachnoid hemorrhage have been attributed to advances in operative and anesthetic techniques, intensive perioperative care, and the recognition and treatment of secondary effects such as hydrocephalus, fluid-electrolyte disorders, and cerebral vasospasm. As perioperative therapy has improved outcome, perhaps the greatest risk to patients with ruptured intracranial aneurysms is inappropriate diagnosis and their delayed referral following a subarachnoid hemorrhage.

The propensity of ruptured aneurysms to rebleed was well documented in the large cooperative studies of the 1970s and 1980s. Recent prospective studies from Scandinavia have substantiated early rebleeding rates from 13% to 22%, with a high percentage occurring within 24 hours of the initial hemorrhage. These studies confirmed earlier observations that the outcome after rebleeding is consider-